## **EUROPEAN PATENT OFFICE**

## **Patent Abstracts of Japan**

**PUBLICATION NUMBER** 

11087424

**PUBLICATION DATE** 

30-03-99

APPLICATION DATE

10-09-97

APPLICATION NUMBER

09245123

APPLICANT: HITACHI LTD;

INVENTOR:

MIWA TAKASHI;

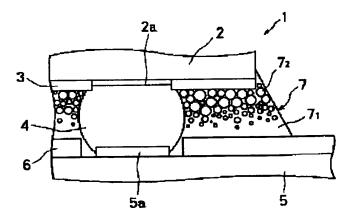
INT.CL.

H01L 21/60

TITLE

SEMICONDUCTOR DEVICE AND

PRODUCTION THEREOF



ABSTRACT :

PROBLEM TO BE SOLVED: To enhance the connection reliability significantly by preventing concentration of stress to a metal bump and stripping of an insulating material from a semiconductor chip.

SOLUTION: A semiconductor device 1 subjected to flip-chip connected has a gap between the surface of a semiconductor chip 2 and the surface of a printed wiring board 5 filled with an insulating resin 7, e.g. an epoxy resin, where organic component 71 is mixed with silica tiller particles  $7_2$  at a content of about 65%. Content of the filter particles  $7_2$  is varied slightly from the semiconductor chip 2 side toward the printed wiring board 5 side so that the coefficient of thermal expansion is varied continuously. The coefficient of thermal expansion is matched with that of a bump 4 by the insulating resin 7. On the interface of bonding to the semiconductor chip 2, the coefficient of thermal expansion is matched by the insulating resin 7 the coefficient of thermal expansion of which is decreased by high content of the filter particles  $7_2$ .

COPYRIGHT: (C)1999,JPO